UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,183	12/16/2004	Rainer Bott	M1211/20018	5602

3000 7590 01/10/2008	EXAMINER
CAESAR, RIVISE, BERNSTEIN, COHEN & POKOTILOW, LTD. 11TH FLOOR, SEVEN PENN CENTER 1635 MARKET STREET PHILADELPHIA, PA 19103-2212	MALEK, LEILA

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
01/10/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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patents@crbcp.com

	Application No.	Applicant(s)
Office Action Summary	10/518,183	BOTT ET AL.
	Examiner	Art Unit
	Leila Malek	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _24 October 2007_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-28_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6 and 9_ is/are rejected.

7)☒ Claim(s) _7, 8, and 10-28_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _24 October 2007_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All   b)☐ Some * c)☐ None of:

   1.☒ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed on 10/24/2007 have been fully considered but they

are not persuasive.

Applicants' Argument: Applicants argue that Wang does not disclose or suggest that

the scatterer coefficients determined can be used for equalizing and demodulating the

data signals transmitted via a time-variant channel to a receiver.

Examiner's Response: Examiner asserts that Wang does not disclose that the data

signal is equalized with the scatterer coefficients and then demodulated with them.

However, Wiedeman discloses a receiver apparatus comprising an equalizer and a

demodulator, wherein the equalizer equalizes a Doppler frequency offset (interpreted as

the first scatterer coefficient) for each correlated signal and the delay (interpreted as the

second scatterer coefficient) of each of the correlated signals (see column 15, last

paragraph). Wiedeman further discloses that the receiver includes circuitry for

combining together all equalized correlated signals to provide a demodulator with a

composite received signal (see column 15, last paragraph). It would have been obvious

to one of ordinary skill in the art at the time of invention to modify Wang as suggested

by Wiedeman in order to transmit the majority of the signal over the communication path

(or paths) which are capable of conveying a highest quality signal (see column 16, first

paragraph) and as the result increase the performance of the receiver.

Applicants' Argument: Applicants argue that there is no teaching or suggestion in

Wiedeman's reference that a receiver receiving data signal transmitted via a single

carrier or a multi-carrier data-transmission on a time-variant channel can use the

scatterer coefficients for equalizing and demodulating the received data signal.

Examiner's Response: In response to applicant's arguments against the references

individually, one cannot show nonobviousness by attacking references individually

where the rejections are based on combinations of references. See *In re Keller*, 642

F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231

USPQ 375 (Fed. Cir. 1986).

Drawings

2.   The drawings were received on 10/24/2007. These drawings are accepted.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

Claims 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. As to claim 4, limitation, the measurement of the scatterer

coefficients ... is in the context of multi-carrier data transmission schemes for receiving

known data sequences, is vague.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. ("Generation of scattering functions by computer simulation for mobile communication channels", Vehicular Technology Conference, 1996. 'Mobile Technology for the Human Race'., IEEE 46th; Publication Date: 28 Apr-1 May 1996, Volume: 3, On page(s): 1443-1447 vol.3.), in view of Wiedeman et al. (hereafter, referred as Wiedeman) (US 5,796,760).

As to claim 1, Wang discloses a data signal transmitted via a time-variant channel to a receiver (see page 1443), wherein scatter coefficients including attenuation (see page 1444, left column), delay and Doppler frequency (see page 1444, right column) in the received data signal, which cause signal distortion in the channel, are measured in the receiver (see pages 1443 and 1444). Although Wang does not disclose that the signal is transmitted using a single-carrier or multi-carrier, in order to transmit the signals from transmitter to the receiver, inherently, there must be at least one carrier (single carrier). Wang discloses all the subject matters claimed in claim 1, except that the data signal is equalized with the scatterer coefficients and then demodulated with them. Wiedeman discloses a receiver apparatus comprising an equalizer and a demodulator, wherein the equalizer equalizes a Doppler frequency offset (interpreted as the first scatterer coefficient) for each correlated signal and the delay (interpreted as the second scatterer coefficient) of each of the correlated signals (see column 15, last paragraph). Wiedeman further discloses that the receiver includes circuitry for combining together all equalized correlated signals to provide a demodulator with a

composite received signal (see column 15, last paragraph). It would have been obvious

to one of ordinary skill in the art at the time of invention to modify Wang as suggested

by Wiedeman in order to transmit the majority of the signal over the communication path

(or paths) which are capable of conveying a highest quality signal (see column 16, first

paragraph) and as the result increase the performance of the receiver.

As to claim 3, Wang does not expressly disclose that the measurements have

been taken place in the context of single-carrier data transmission schemes. However,

in order to transmit the signals from transmitter to the receiver, inherently, there must be

at least one carrier (single carrier).

5.   Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang

and Wiedeman, further in view of Borowski (US 3,997,841).

As to claim 2, Wang discloses that the measurement of the scatterer coefficients

has been taken place in the time domain (see the abstract and page 1443, right

column). Wang and Wiedeman disclose all the subject matters claimed in claim 2,

except that the equalization of the data signal takes place within the time domain.

Borowski discloses that the advantages of the time-domain equalizers are that sufficient

noise suppression can be achieved, which permits the use of a low-noise amplifier with

sufficient control range (see column 1, paragraph 4). Therefore, for the reasons stated

above, it would have been obvious to one of ordinary skill in the art at the time of

invention to modify Wang and Wiedeman to use a time domain equalizer to equalize the

data signal.

6.   Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang

and Wiedeman, further in view of Schenk et al. (hereafter, referred as Schenk) (US

6,647,076).

As to claim 5, Wang discloses that the measurement of the scatterer coefficients

has been taken place in the frequency domain (see the abstract and page 1443, right

column). Wang and Wiedeman disclose all the subject matters claimed in claim 5,

except that the equalization of the data signal takes place within the frequency domain.

Schenk discloses that a frequency domain equalizer is used for the channel

equalization of a signal vector (see column 5, lines 35-40). Schenk further discloses that

the frequency domain equalizers require a smaller outlay on circuitry than time domain

equalizers and can be implemented as a simple and fast algorithm and as a simple

circuit (see column 2). Therefore, for the reasons stated above, it would have been

obvious to one of ordinary skill in the art at the time of invention to modify Wang and

Wiedeman to use a frequency domain equalizer to equalize the data signal.

7.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang,

Wiedeman, and Schenk, further in view of Schafhuber et al. (hereafter, referred as

Schafhuber) (Adaptive prediction of time-varying channels for coded OFDM systems

Schafhuber, D.; Matz, G.; Hlawatsch, F.; Acoustics, Speech, and Signal Processing,

2002. Proceedings. (ICASSP '02). IEEE International Conference on

Volume 3, 13-17 May 2002 Page(s):III-2549 - III-2552 vol.3).

As to claim 6, Wang, Wiedeman, and Schenk disclose all the subject matters

claimed in claim 6, except that the measurements of the scatterer-coefficients and the

equalization of the data signal is in the context of multi-carrier data transmission

schemes. Schafhuber, in the same field of endeavor, teaches determining a scattering

function (see page 2549, right paragraph), and therefore inherently the scatterer-

coefficients, and the equalization of the data signal (see Fig. 2) in the context of multi-

carrier data transmission schemes (i.e. the OFDM) (see page 2549). It would have been

obvious to one of ordinary skill in the art at the time of invention to use the teachings of

Wang, Wiedeman, and Schenk, to make the system disclosed by Schafhuber more

simple and cost effective.

8.   Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang

and Wiedeman, further in view of Ratnarajah et al. (hereafter, referred as Ratnarajah)

(US 6,757,339).

As to claim 9, Wang and Wiedeman disclose all the subject matters claimed in claim

1, except that a first measurement of the scatterer coefficients is implemented with the

assistance of a known data sequence. Ratnarajah discloses a method for estimating the

sequence of transmitted symbols in a digital communication system (see the abstract).

Ratnarajah discloses that the channel impulse response coefficients (i.e. interpreted as

scatterer coefficients) are determined from training symbols embedded in the

transmitted data sequence (See column 1, lines 37-49). It would have been obvious to

one of ordinary skill in the art at the time of invention to modify Wang and Wiedeman as

suggested by Ratnarajah, to more accurately determine the coefficients.

Allowable Subject Matter

9.   Claims 7, 8, and 10-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leila Malek whose telephone number is 571-272-8731. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leila Malek
Examiner
Art Unit 2611

L.M.

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER